



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(7): 3768-3772
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www.thepharmajournal.com

Received: 11-05-2022

Accepted: 15-06-2022

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A study on marketing of tiger prawn in south 24 Parganas district of West Bengal

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Abstract

Tiger Prawn is a fastest growing species. It used in aquaculture with major potentiality in India, Bangladesh and a few other countries. India is the major producer of tiger prawn, India is one of the major shrimps producing country, possesses a huge brackish water area that is highly suitable for prawn farming. A total of 620,000 metric ton of shrimps were produced from an estimated area of 11.90 lac ha from India in the year 2020-2021. The state of West Bengal in India has an immense potential for commercial shrimp farming and presently three coastal districts North 24 Parganas, South 24 Parganas and East Midnapore having brackish water area of about 2.10 lakh ha are suitable for coastal farming. The dominant species under culture in West Bengal is *Penaeus Monodon* due to its high unit value realization and over expanding export demand. The production of *Penaeus monodon* through aquaculture in West Bengal was about estimated 19,190 ton and area under culture 50,000 hectares. West Bengal ranks top in area under culture and production of tiger prawn in India. The study on the socio-economic status and of fishermen community associated with brackish water farming at South 24 Parganas. Due to various reasons, they replaced Tiger Shrimp (*Penaeus monodon*) culture and shifted to Vannamei (*Litopenaeus vannamei*) culture and fetching more productivity as well as profit in respect to same unit area. This research conducted in the study area to determine the socio-economic profile of the fishermen and the marketing cost, marketing margin, price spread in different marketing channel of tiger prawn.

Keywords: Tiger Prawn, aquaculture, socio-economic, marketing cost, marketing margin, price spread

Introduction

Prawn is a common name for small aquatic crustaceans with an exoskeleton and ten legs (which is a member of the order Decapoda), some of which can be eaten. It is the fastest growing species used in aquaculture with major potentiality in India, Bangladesh and a few other countries. *P. monodon* is euryhaline and can tolerate nearly freshwater conditions, although 10-25 ppt salinity is considered optimum. It can tolerate a temperature between 12 °C and 37.5 °C.

Apart from *P. monodon*, other commercially farmed shrimps are *P.japonicus*, *P. indicus*, *P. merguensis* and *P. vannamei*. Although considerable similarities in the culture technology is present for these species, there are also a number of differences. These differences are due to environmental requirements, breeding, feeding behavior and compatibility with other species. However, *P. monodon* is the most extensively cultivated prawn among the 29 recorded penaeids because it is best suited for culture in confinements, attainment of large size, faster growth, hardy nature, greater tolerance to varying salinity, temperature and oxygen, natural abundance of seed and high market price with large export potentiality.

India is a second largest shrimp producer country, after China with a production of 38,000 metric tons in 2019-2020. Presently, nearly 11.91 lakhs ha of coastal saline land are used for shrimp culture in India. India, the world's top exporter of tiger prawn. India's tiger prawn production fell to 38,000 metric tons (MT) in financial year 2019-2020. India has been the top exporter of shrimp to the United States. India increased its market share in the U.S.A up to a high of 40.5 percent in 2019. But India's shrimp sector had a difficult year in 2020 with production and export performance severely hit by the COVID-19 pandemic. And 2021 has been ever worse for India as it experienced one of the worst outbreaks of COVID-19 globally, causing serious harm to its shrimp industry.

Materials and Methods

Selection of district

West Bengal state consists of 5 administrative divisions with 23 districts Out of these, South 24 Parganas district was most preferable for this study because this district is one of the largest

tiger prawns producing district after Purba Medinipur. In this district there are 29 Tehsils & blocks. From this blocks Kakdwip block was most preferable for this study due to availability of fisherman with their land holding property. Therefore, South 24 Parganas district was selected purposively for the study.

Selection of block

There are 29 blocks in South 24 Parganas district. Out of them Kakdwip block was selected purposively. Because this block has large tiger prawn wholesale market. That's why this block was selected purposively for the study.

Selection of village

Out of total 39 villages falling in the Kakdwip block, some villages are selected purposively for primary data collection. The criteria for selection of villages were the maximum number of farmers grow fisheries and required number of sample farmers was available.

Selection of respondents

List of all shrimp farmers has been prepared with the help of village Pradhan or panchayat office. Then this list was arranged in descending order. Fish farmer was categorized in three different groups 'small', 'medium' and 'large' shrimp farmers. A list of all farmers was prepared and 5% of the fish growers of the village were selected randomly for the study.

Analytical Tool

For achieving the stated objective, the analytical tools such as tables, charts and graphs simple ranking, percentage method will be used.

1. Marketing margin of middleman

Absolute margin [Ami= Pri- (PpiCmi)]

Percentage margin (Pmi)

$Pm_i - Pni$ (Ppit Cm i)

$Pnix$ 100

Where, Pri is the total value of receipts per unit.

Ppi is the purchase value of goods per unit (purchase price). is he cost incurred in pur ha per uni

2. Price spread = Price paid by the Consumer - Price Received by the producer

3. Cost of marketing

The total cost incurred on marketing by various intermediaries involved in the sale and purchase of the commodity till it reaches the ultimate consumer was computed as follow.

$$C=Cf+Cm1+Cm2+Cm3+..... +Cmn$$

Were,

C=Total cost of marketing

Cf=Cost borne by the producer farmer from the produce leaves the farm till the sale of the produce, and

Cmn= Cost incurred by the middlemen in the process of buying and selling.

4. Producer's share in Consumer's Rupee

$$Ps=PF/Pc* 100$$

Where,

Ps= Producer's share in Consumer's Rupee

Pf=Price of the produce received by the farmer

Pc Price of the produce price of the produce paid by the consumer

5. Marketing Efficiency

Marketing efficiency is the degree of market performance. It is the ratio of market output to market input.

Conventional Method

$$\text{Index of marketing efficiency (E)} = O / I * 100$$

Where,

O= value added by the marketing system

I= cost of market intermediaries

Statistical Analysis

1. Standard Deviation

It is used to find out the variation in the score in the dependent variable and for categorization of the respondents.

$$\sigma = \sqrt{\frac{\sum(x_i - \mu)^2}{N}}$$

σ = population standard deviation

x_i = each value from the population

N = the size of the population

μ = the population mean

2. Garrett ranking technique

$$\text{Percent position} = 100(R_{ij} - 0.5)/N_j$$

Where,

R_{ij} = Rank given for the ith variable by jth respondents

N_j = Number of variables ranked by jth respondents

$$\text{Percentage: Value/Total value} * 100$$

Period of Enquiry

The study related to the year 2021-22. The study covered all farm activities adopted by the fish growers during agricultural year 2021-22.

Results & Discussion

Present chapter deals with results of the study. The result of the study was analyzed with the use of data collection for this investigation. The data has been processed and tabulated in the light of the objectives of present study.

The whole chapter was divided into following three main sub heads:

1. To study the socio economics of tiger prawn grower.
2. To work out marketing cost, marketing margin and price spread in different marketing channel of tiger prawn.

Objective 1: To study the socio economics of tiger prawn grower

a) Pond size holding

The average size of pond holdings and the amount devoted to fish production for the sample farmer in the study. It shows that the average pond size for all the three groups 3.09 ha is devoted to tiger prawn cultivation.

Table 1: Average Pond size holding in hectares of South 24 Parganas

	Small	Medium	Large	Average
Area of fishing (ha)	1.21	3.23	4.85	3.09

b) Gender distribution

Below reveals the majority 69.23%, 81.48% and 90% of the shrimp cultivators in the small, medium and large fisherman size were found to be males with few 30.76%, 18.51% and

10% females in small, medium and large fisherman size.

Table 2: Gender distribution of the respondents in the study area

Category	Small	Medium	Large	Average	SD
Males	9(69.23)	22(81.48)	18(90)	16.33(80.23)	4.22
Females	4(30.76)	5(18.51)	2(10)	3.66(19.75)	0.94
Total	13(100)	27(100)	20(100)	60(100)	

c) Age distribution

below reveals the majority 69.23%, 74.07% and 90% of fish cultivators within the three-size group small, medium and large in the area were within age of 21-60 years, hence this age category revealed that the majority of shrimp cultivators in the study area are within the working and productive age

that provides a great working force in the study areas.

Table 3: Age distribution of respondents in study area

Category (year)	Small	Medium	Large	Average	SD
Below 20	2(15.38)	3(11.11)	0(0)	1.66	0.43
21-60	9(69.23)	20(74.07)	18(90)	15.66	4.04
61 above	2(15.38)	4(14.81)	2(10)	2.66	0.69
Total	13(100)	27(100)	20(100)		

d) Education level

the education status of the family head is another important factor influencing the skill, ability to use the scarce resources and adoption of new technology. The information regarding the education status of the family heads is presented in table.

Table 4: Distribution on the literacy level in the study area

Literacy level	Small	Medium	Large	Average	SD
Literate	3(23.07)	2(7.40)	0(0)	1.66	0.43
Primary	5(38.46)	4(14.81)	1(5)	3.33	0.86
Middle High School	3(23.07)	7(25.92)	3(15)	4.33	1.11
Intermediate	2(15.38)	6(22.22)	6(30)	4.66	0.94
Graduation and above	0(0)	8(29.62)	10(50)	6	1.54
Total	13(100)	27(100)	20(100)		

e) Occupation

In the study area the majority 66.66% and 100% of the respondents in the three-farmer size group medium and large consider shrimp culture as their first and major occupation.

Although there are some few farmers in the small and medium groups that consider daily labor as their secondary occupation.

Table 5: Distribution of cultivator’s major occupation.

Occupation	Small	Medium	Large	Sample Average	SD
Agriculture & Business	5(38.46)	18(66.66)	20(100)	14.33	3.70
Other (daily labor)	8(61.53)	9(33.33)	0	5.66	1.96
Total	13(100)	27(100)	20(100)	60	

Objective II: To work out marketing cost, marketing margin and price spread in different marketing channel of tiger prawn.

Producer → **Company** → **Consumer (Export)**

Table 6: Marketing Cost, Marketing Margin and Price Spread of tiger prawn (Rs/kg)

Sl. No.	Particulars	Tiger Prawn Price(kg)
	Sale price of producer	300
1	Cost incurred by producer	
	Packing cost	60
	Weighing	15
	Loading/Unloading charges (kg)	15
2	Total cost	90
	Sale price of company	600
	Buying price of company	300
	Cost incurred by company	
	Packing cost	60
	Loading /unloading charge	5
	Transportation Cost	6
	Processing cost	4
	Storage cost	7
3	Total cost	82
4	Total marketing cost	172
5	Total marketing margin	218
6	Price spread	300

The above table reveals the marketing channel I. It shows total marketing cost incurred for a producer which involves packing, weighing of the tiger prawn which is Rs 172/kg. and marketing margin recorded Rs 218/kg. of tiger prawn respectively.

Channel II

Producer → **Auctioneer** → **Wholesaler** → **Retailer** → **Consumer**

Table 7: The market cost, market margin and price spread of channel 2

Sl. No.	Particular	Rs/Kg
1.	Sale price of producer	400
	Auctioneer commission	20
	Total marketing cost	90
	Producers selling price	400
	Net price received by producer	290
2.	Cost incurred by wholesaler	
	Wholesalers buying price	400
	Transportation	8
	Loading and unloading	5
	Miscellaneous	15
	Wholesaler's marketing cost	28
	Wholesaler's marketing margin	100
	Wholesaler's selling price	498
3.	Cost incurred by retailer	
	Retailers paid price	528
	Loading and unloading	6
	Miscellaneous	18
	Storing and icing	8
	transportation	10
	Retailer's marketing cost	42
	Retailer's marketing margin	70
	Retailer's selling price	640
4.	Total marketing cost	160
5.	Total marketing margin	170
6.	Total price spread	240

The Above table reveals the market cost, market margin and price spread of channel 2, four intermediaries were identified in this marketing channel. Producer sells his produce to trader through auctioneer. Producer finds targeted traders and auctions the produce to traders and in turn sells it to the traders in the market. The traders buy the produce from farmer and transports to various markets to distribute among wholesalers adding his market cost and market margin i.e., Rs 160/kg and Rs. 170/kg. Then wholesalers distribute the produce to local retailers with certain margin. Finally, the producer reaches customer after collecting commissions. Marketing cost when producers sold the produce is Rs 20/kg which is auctioneer's commission. Similarly, retailers marketing cost and marketing margin i.e., Rs 42/kg and Rs 70/kg. In total average total marketing cost are 160, marketing margin is recorded as Rs 170/kg. Price spread is recorded as Rs 240/kg.

Conclusion

The important findings of the study are summarized below- The average size of pond holdings and the amount devoted to fish production for the sample farmer in the study. It shows that the average pond size for all the three groups 3.09 ha is devoted to tiger prawn cultivation.

The study also reveals the majority 69.23%, 81.48% and 90% of the shrimp cultivators in the small, medium and large fisherman size were found to be males with few 30.76%, 18.51% and 10% females in small, medium and large fisherman size.

The majority 69.23%, 74.07% and 90% of fish cultivators within the three-size group small, medium and large in the area were within age of 21-60 years, hence this age category revealed that the majority of shrimp cultivators in the study area are within the working and productive age that provides a great working force in the study areas.

It is observed that in small farmer respondents 23.07

percentage are literate and 38.46 percentage of respondents completed primary school and 23.07 percentage of respondents completed middle school and 15.38 percentage of respondents completed intermediate and zero percent of respondents completed graduation and above.

In medium farmer respondents 7.40 percentage are literate and 14.81 percentage of respondents completed primary school and 25.92 percentage of respondents completed middle school and 22.22 percentage of respondents completed intermediate and 29.62 percent of respondents completed graduation and above.

In large farmer respondents zero percentage are literate and 5 percentage of respondents completed primary school and 15 percentage of respondents completed middle school and 30 percentage of respondents completed intermediate and 50 percent of respondents completed graduation and above.

In the study area the majority 66.66% and 100% of the respondents in the three-farmer size group medium and large consider shrimp culture as their first and major occupation.

Although there are some few farmers in the small and medium groups that consider daily labor as their secondary occupation.

In channel I, the market cost Rs 172/kg was born by shrimp producer. The total market margin of tiger prawn was found Rs 218/kg. and price spread was Rs 300/kg. Respectively.

In channel II, reveals the market cost, market margin and price spread of channel 2, four intermediaries were identified in this marketing channel. Producer sells his produce to trader through auctioneer. Producer finds targeted traders and auctions the produce to traders and in turn sells it to the traders in the market. The traders buy the produce from farmer and transports to various markets to distribute among wholesalers adding his market cost and market margin i.e., Rs 160/kg and Rs. 170/kg. Then wholesalers distribute the produce to local retailers with certain margin. Finally, the producer reaches customer after collecting commissions. Marketing cost when producers sold the produce is Rs 20/kg which is auctioneer's commission. Similarly, retailers marketing cost and marketing margin i.e., Rs 42/kg and Rs 70/kg. In total average total marketing cost are 160, marketing margin is recorded as Rs 170/kg. Price spread is recorded as Rs 240/kg.

In the study area channel I is use for export to other state or country. And channel II is use in rural area as well as urban area.

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